

Dentist's Perception of Medication Safety in Saudi Arabia

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ABSTRACT

Objectives: The study aims to discover the dentist's perceptions of medication safety in the Kingdom of Saudi Arabia. **Methods:** It is an analysis of a cross-sectional survey that reconnoitered the dentist's medication safety perceptions in Saudi Arabia. It self-reported an electronic survey of dentists, comprising dentists from internship to the consultant, dental specialties in Saudi Arabia. The survey contained respondents' demographic information about dentists and perception of medication safety in dental care. Also, the perception of barriers averts off employment of the medication safety system in dental care. The 5-point Likert response scale system was employed with closed-ended questions. The data analysis of the dentist's knowledge of medication safety is finished through the survey monkey system. The statistical package of social sciences (SPSS), Jeffery's Amazing Statistics Program (JASP), and Microsoft excel sheet version 16 were used in the study. **Results:** The total number of responding dentists was 242, with the majority of them coming from the central region 95 (39.26%) with statistically momentous among the areas ($p < 0.05$). Of those, 144 (59.75%) were male, while 97 (40.25%) were female, with statistically significant between them ($p < 0.05$). The average scores of dentist's perceptions of medication safety in dental care were 3.99; the dentist's high scores component was relaxed to ask for assistance support from colleagues or peers concerning medication safety (4.27). Medications storage with labeling is a vital element of medication safety in dental care (4.26). The average scores of perception of barriers prevent you from instigating medication safety in dental care (3.52). The high scores element was level of clinical knowledge about dental medications safety services (3.98) and lack of periodic training of dental staff dental medications safety services (3.94). The reliability test includes Cronbach alpha (0.933) and McDonald's ω (0.920). **Conclusion:** The dentist's perceptions of medication safety were flawless in Saudi Arabia. Periodic education and training medication safety in dental care is obligatory to improve the dental medication safety system and patient outcomes in dental care in Saudi Arabia.

Key words: Dentist, Perception, Medication, Safety, Saudi Arabia.

INTRODUCTION

Over the past years, healthcare education and training are growing significantly in the Kingdom of Saudi Arabia. The college of Medicine, college of dentistry, college of pharmacy, and nursing is nearly double. Also, the number of residency programs upsurges over the years, with the number of postgraduates.^{1,2} The quality of healthcare programs variations over time, containing the period of training and content. One of the programs well established in Saudi Arabia was medication safety education and training.³⁻⁵ Medication safety was part of numerous residency medical, pharmacy undergraduate, and postgraduate studies. However, dentistry's local college still demands full aspect of the medication's safety program in the undergraduate and postgraduate studies and program. Moreover, the medication safety procedures were not fully employed at dental care related to several barriers preventing medication safety services. As a result, the dentist states their practice not even feeling about patient safety elements in multiple investigations.⁶⁻⁹ However, it is rare to find a study about medication safety perception in dental care in Saudi Arabia or the Gulf and Middle East countries.^{6,10-13} The authors are not accustomed to any study up to their

knowledge. This study discovers the dentist's perception of medication safety at their dental practice in Saudi Arabia.

METHODS

It is a descriptive cross-sectional study that acknowledged dentist's perception of medication safety in Saudi Arabia. It self-reported an electronic monkey survey of dentists. It encompassed all dentists from consultant to internship, dental specialties, and lived in Saudi Arabia. All non-dentists or students and non-completed surveys will be omitted from the study. The survey entailed demographic information about dentists and perception of medication safety in dental care. Also, the perception of barriers prevents off implementation of the medication safety system in dental care. The 5-point Likert response scale system was employed with closed-ended questions. According to the previous literature with unlimited population size, the sample was considered a cross-sectional study, population percentage of 50%, the confidence level 95% with a z score of 1.96, margin of error 5-6.5%, and drop-out rate of 10%. As a result, the sample size will equal 251 to 432 with a power

of study of 80%.¹⁴⁻¹⁶ The response rate essential of calculated sample size at least 60-70% and above.^{16,17} The survey was dispersed through social media of WhatsApp application and telegram groups of dentists. The reminder message had been referred to every week. The survey was authenticated through the revision of expert reviewers and pilot testing.

Further, the reliability test includes Cronbach alpha, McDonald's ω , Gutmann's λ_2 , and Gutmann's λ_6 had been completed with the study. The data analysis of the dentist's perception of medication safety is ended through the survey monkey system. The statistical package of social sciences (SPSS), Jeffery's Amazing Statistics Program (JASP), and Microsoft excel sheet version 16 with description and frequency analysis, good fitness analysis, correlation analysis, inferential analysis of factors affect dentist's perception of medication safety. The STROBE (Strengthening the reporting of observational studies in epidemiology statement: guidelines for reporting observational studies) guided the reporting of the current study.^{18,19}

RESULTS

The total number of responding dentists was 242, with the majority of them coming from the central region 95 (39.26%) with statistically momentous among the areas ($p < 0.001$). Of those, 144 (59.75%) were male, while 97 (40.25%) were female, with statistically significant between them ($p < 0.001$). Most of the responders were in age (24-35) years 214 (88.43%) with statistically significant between all ages level ($p < 0.001$). Almost half of the dentists were general practitioner 144 (47.11%), followed by intern 60 (24.79%), with the majority of them were holding dental staff jobs 158 (65.29%) with statistically significant between them ($p < 0.001$). Most dentists had skilled three years and less 179 (74.27%) with almost half of them non-specialized dentists 96 (44.65%) with statistically significant between them ($p < 0.001$) (Table 1 and 2). The average scores of dentist insights of medication safety in dental care were 3.99; the high scores element was dentist calm to inquire for help support from colleagues or peers concerning medication safety (4.27). Medications storage with labeling is the critical rudiment of medication safety in dental care (4.26). In contrast, the lowest scores were average patient does not want to know about medications error; that did not cause them injury in dental care (3.36), and in their institution, medications safety policy and procedures well-implemented (3.46) with statistically significant between answers ($p < 0.001$) (Table 3). The average scores of perception of barriers prevent you

from implementing medication safety in dental care (3.52). The high scores element was level of clinical knowledge about dental medications safety services (3.98) and lack of periodic training of dental staff dental medications safety services (3.94), while the lowest scores were 3.08. The medication safety is not severe or unusual was don't feel the need to report well-recognized protection for a specific drug (3.08) with statistically significant between answers ($p < 0.001$) (Table 4). The reliability test includes Cronbach alpha (0.933), McDonald's ω (0.920), Gutmann's λ_2 (0.937), and Gutmann's λ_6 (0.966).

Factors Affecting the Perception of Medication Safety in Dental Care

Gender

There is no statistically noteworthy difference between males and females in most facets of medication safety perception in dental practice ($p > 0.05$). However, the male, more agreeable than females in the hospitals, endorses reporting medication errors and other safety measures in dental care 52 (35.37%), and the discussion medications safety with staff 49 (33.33%). Also, dental staff feels mistakes are detained against them when described 45 (30.61%), training and medications safety 82 (55.78%). Medications wastage services were vivacious in dental care 81 (55.1%) vs. 22 (21.78%), 22 (21.78%), 17 (16.83%) and 40 (39.6%), respectively with statistically significant differences ($p < 0.05$).

There is no statistically significant difference between males and females in all barriers averting the employment of medication safety in dental care ($p > 0.05$). Except, the male 35 (23.97%) more settled in the reason of medications safety were not serious nature or unusual then female 12 (12.24%) with statistically significant difference ($p < 0.05$).

Age

There is no statistically significant difference between all age levels and all facets of perception of all medication safety features in dental care ($p > 0.05$). There is no statistically significant difference between all age levels and medication safety barriers in dental care ($p > 0.05$).

Experience

There is no statistically significant difference between all years of experience and all phases of perception regarding medication safety in dental care ($p > 0.05$). Except, the dentist with less than one-year experiences [34 (32.38%)] more agreement than 1-3 years [22 (28.57%)] or 4-5 years [2 (6.06%)] in the health insurance

not enclosed of medications safety measures with statistically significant difference ($p < 0.05$). There is no statistically significant difference between all years of experience and medication safety barriers in dental care ($p > 0.05$).

Except, the dentists with less than one year experiences more agreement than 4-6 years experiences in the apprehension of generating extra work, lack time of execution dental medications safety, did not know how to contrivance dental medications safety, fear of legal liability, and ignorant of dental medications safety services 38 (36.19%), 24 (22.86%), 39 (37.14%), and 33 (31.73%), vs. 5 (15.15%), 2 (6.06%), 42 (53.16%), and 8 (24.24%), respectively. While the dentists had 1-3 years experience, 38 (48.1%) than less than one-year experiences 35 (33.65%) in the lack of periodic training of dental staff in the medication's safety with statistically significant difference ($p < 0.05$).

Table 1: Demographic, social information.

Nationality	Response Count	Response Percent	p-value (X2)
Central area	95	39.26%	<0.001
North area	20	8.26%	
South area	45	18.60%	
East area	35	14.46%	
West area	47	19.42%	
Answered question	242		
Skipped question	0		
Gender	Response Count	Response Percent	
Male	144	59.75%	<0.001
Female	97	40.25%	
Answered question	241		
Skipped question	1		
Age	Response Count	Response Percent	
24-35	214	88.43%	<0.001
36-45	22	9.09%	
46-55	4	1.65%	
> 55	2	0.83%	
Answered question	242		
Skipped question	0		

Table 2: Demographic, social information.

Dentist Qualifications	Response Count	Response Percent	p-value (X2)
Intern	60	24.79%	<0.001
Resident	32	13.22%	
General Practitioner	114	47.11%	
Specialist	15	6.20%	
Consultant	21	8.68%	
Answered question	242		
Skipped question	0		
Position Held	Response Count	Response Percent	
Director of dental unit	47	19.42%	<0.001
Assistant director of dental unit	8	3.31%	
Dental Director	29	11.98%	
Dental staff	158	65.29%	
Answered question	242		
Skipped question	0		
Years of experiences at Dentists career	Response Count	Response Percent	
< 1	104	43.15%	<0.001
1 – 3	75	31.12%	
4 – 6	32	13.28%	
7 - 9	9	3.73%	
> 9	12	4.98%	
Answered question	241		
Skipped question	1		
Dentist Specialties	Response Count	Response Percent	
Dental Public Health	10	4.65%	<0.001
Endodontics	14	6.51%	
Oral and Maxillofacial Surgery	11	5.12%	
Oral Medicine and Pathology	3	1.40%	
Oral and Maxillofacial Radiology	0	0.00%	
Orthodontics and Dentofacial Orthopedics	11	5.12%	
Pediatric Dentistry	15	6.98%	
Periodontics	7	3.26%	
Prosthodontics	10	4.65%	
Restorative dentistry	9	4.19%	
Special needs dentistry	1	0.47%	
Non-applicable	22	10.23%	
General practitioner	96	44.65%	
Other (please specify)	6	2.79%	
Answered question	215		
Skipped question	27		

Qualifications

There is no statistically significant difference between all qualification levels and all insight of facets of medication safety measures in dental care ($p>0.05$). Except, the general practitioner 49 (42.24%) and intern 22 (36.07%) more agreed than residents 5 (15.15%) in dental therapeutic guidelines not extensively executed in dental organizations with statistically significant difference ($p>0.05$). The residents 16 (48.48%) more agreed than general practitioner 31 (26.72%) in the medications storage with labeling system with a statistically noteworthy difference ($p<0.05$). The general practitioner 67 (57.76%) more agreed than intern 25 (40.98%) in the varying system of drug interaction, pregnancy, and lactation to avert medication errors with statistically significant difference ($p<0.05$). The dentist's general practitioner more agreed than residents with statistically significant difference ($p<0.05$) in dental medications safety course not given at most of the dental organizations 48 (41.74%) vs. 7 (21.21%) respectively. The health insurance did not shelter most medications safety measures in dental care 38 (33.04%) vs. 4 (12.12%).

There is no statistically meaningful difference between all qualifications levels and medication safety barriers in dental care ($p>0.05$). Except, the residents more agreed than a general practitioner in feeling no necessity of medications safety documentation with statistically significant difference ($p<0.05$)

Position

There is no statistically significant difference between all position levels and all discernment of medication safety measures in dental care ($p>0.05$). There is no statistically significant difference between all position levels and medication safety barricades in dental care ($p>0.05$).

There is no association with no statistically significant difference ($p>0.05$) between all factors gender, age, years of experiences, academic qualifications, and dental positions, and all facets of medication safety acuity. All barriers prevent the employment of medication safety in dental care.

DISCUSSION

The dentists practice various daily diseases and their management and consist of high alert medications.^{11,12} The dentist deal with Anesthesia procedures, pain management in dental care, some patient's medications, including antidiabetic medicines like insulin, and more other medications and disease management.^{20,21} The dentists request to implement all medication safety rudiments and procedures during dental practice to avert

Table 3: The Perception of Medication Safety in dental care.

	Strongly agree		Agree		Uncertain		Disagree		Strongly Disagree		Total	Weighted Average	p-value
In our institution, medications safety policy, and procedures well-implemented	28.45%	68	22.59%	54	27.20%	65	10.46%	25	11.30%	27	239	3.46	< 0.001
Medications safety in dental care has led to positive changes	48.75%	117	30.00%	72	16.25%	39	2.50%	6	2.50%	6	240	4.2	< 0.001
The hospitals promote itself as an organization that responds to Medication Errors (MEs) and other safety-related issues	30.42%	73	30.00%	72	30.00%	72	5.00%	12	4.58%	11	240	3.77	< 0.001
I think there is under-implemented Medication safety elements in the hospital	37.92%	91	30.83%	74	23.75%	57	4.58%	11	2.92%	7	240	3.96	< 0.001
I feel comfortable to ask for help support from colleagues or peer concerning of Medication safety	47.92%	115	35.00%	84	14.58%	35	0.83%	2	1.67%	4	240	4.27	< 0.001
I have the opportunity to discuss and receive feedback about medications safety with other staff	28.75%	69	28.33%	68	31.25%	75	5.00%	12	6.67%	16	240	3.68	< 0.001
Dental staff feel like their mistakes are held against them when an event is reported	25.83%	62	31.67%	76	32.92%	79	7.08%	17	2.50%	6	240	3.71	< 0.001
There should be set guidelines for medication error disclosure in dental care.	38.24%	91	39.50%	94	18.07%	43	2.52%	6	1.68%	4	238	4.1	< 0.001
I believe that Training about medication safety should be included in dental education.	48.33%	116	32.08%	77	15.83%	38	2.50%	6	1.25%	3	240	4.24	< 0.001
I think the dental therapeutic guidelines are not widely implemented at most of the dental institutions	34.73%	83	36.40%	87	22.18%	53	4.60%	11	2.09%	5	239	3.97	< 0.001
I believe that's continuing education should include medication safety.	46.86%	112	34.31%	82	15.48%	37	2.09%	5	1.26%	3	239	4.23	< 0.001
The average patient does not want to know about medications error that did not cause them harm	21.34%	51	28.87%	69	24.27%	58	15.48%	37	10.04%	24	239	3.36	< 0.001
I will encourage my colleagues to create medications safety culture in dental care	43.93%	105	36.40%	87	15.48%	37	2.51%	6	1.67%	4	239	4.18	< 0.001
Medications wastage services are very essential in dental care	46.86%	112	32.22%	77	15.90%	38	3.77%	9	1.26%	3	239	4.2	< 0.001
Medications storage with labeling is crucial elements of medications safety	48.95%	117	33.05%	79	14.23%	34	2.93%	7	0.84%	2	239	4.26	< 0.001
Electronic prescribing in dental had positive outcome to patients	48.54%	116	30.96%	74	16.32%	39	2.09%	5	2.09%	5	239	4.22	< 0.001
Alerting system of drug interactions and pregnancy or lactation prevent medications errors	50.63%	121	29.71%	71	16.32%	39	1.67%	4	1.67%	4	239	4.26	< 0.001
The off-labeling system in dental care should be implemented to protect the dentist from any liability	46.64%	111	33.19%	79	15.55%	37	2.52%	6	2.10%	5	238	4.2	< 0.001
The dental medications safety course is Not given at most dental institutions	35.29%	84	33.61%	80	23.11%	55	4.62%	11	3.36%	8	238	3.93	< 0.001
The health insurance not covered most of medications safety measures in dental care	25.74%	61	26.58%	63	38.40%	91	6.33%	15	2.95%	7	237	3.66	< 0.001
Answered												240	
Skipped												2	

Table 4: The barriers prevent you from implementing medication safety in dental care?.

	Strongly agree		Agree		Uncertain		Disagree		Strongly Disagree		Total	Weighted Average	p-value
Level of clinical knowledge about dental medications safety services	34.89%	82	37.87%	89	20.43%	48	4.26%	10	2.55%	6	235	3.98	< 0.001
Uncertain association between the dental drugs and safety related issues	19.57%	46	34.04%	80	27.66%	65	11.91%	28	6.81%	16	235	3.48	< 0.001
The medication safety are Not serious nature or unusual	12.71%	30	19.92%	47	14.41%	34	23.73%	56	29.24%	69	236	2.63	< 0.001
Concern that a report will generate extra work.	28.81%	68	38.14%	90	18.22%	43	11.02%	26	3.81%	9	236	3.77	< 0.001
Lack of time to perform dental medications safety	16.10%	38	22.46%	53	24.58%	58	27.12%	64	9.75%	23	236	3.08	< 0.001
Unaware of the existence of a national dental medication safety system.	23.63%	56	38.82%	92	25.74%	61	7.59%	18	4.22%	10	237	3.7	< 0.001
Did not know how to implement dental medications safety	21.94%	52	45.99%	109	20.68%	49	8.86%	21	2.53%	6	237	3.76	< 0.001
Fear of legal liability.	23.73%	56	38.14%	90	23.73%	56	10.59%	25	3.81%	9	236	3.67	< 0.001
Unaware of the need of dental medications safety services	23.83%	56	38.72%	91	20.00%	47	14.04%	33	3.40%	8	235	3.66	< 0.001
Lack of financial reimbursement.	16.95%	40	29.66%	70	34.75%	82	12.29%	29	6.36%	15	236	3.39	< 0.001
Don't feel the need to report well recognized safety for a certain drug	14.83%	35	24.58%	58	25.00%	59	25.42%	60	10.17%	24	236	3.08	< 0.001
Consider it the doctor or pharmacist 's responsibility	27.78%	65	35.47%	83	25.64%	60	6.84%	16	4.27%	10	234	3.76	< 0.001
The negative consequences associated with dental medications safety services	17.45%	41	25.96%	61	34.89%	82	13.62%	32	8.09%	19	235	3.31	< 0.001
Lack of Periodic training of dental staff dental medications safety services	31.36%	74	40.25%	95	21.61%	51	4.24%	10	2.54%	6	236	3.94	< 0.001
Insufficient informing dental care providers about Dental medications safety	25.53%	60	38.30%	90	25.53%	60	6.81%	16	3.83%	9	235	3.75	< 0.001
The dental medications safety is optional and not paid	18.64%	44	30.08%	71	34.32%	81	9.32%	22	7.63%	18	236	3.43	< 0.001
The dental medications safety services was Not taught properly in dental School	26.27%	62	31.36%	74	24.58%	58	12.29%	29	5.51%	13	236	3.61	< 0.001
Answered											237		
Skipped											5		

any drug-related morbidity and mortality. However, some medication perceptions stop dental medication safety; some barriers stop or dishearten medication safety applications in dental practice. The current study will state the dentist's perception of medication safety elements, procedures, and related factors that avert or determine medication safety in dental practice. The responders' results were young dentist's responders freshly graduated and general practitioners who reproduce more dental care practice. The average scores of dentist's perceptions of medication safety elements were suitable with high score elements. The dentists were agreeable to collaborate with other colleagues with dental medication safety. They had a good insight into dental medication storage policy and actions that substitute the excellent practice of essential medication safety.

In contrast, the lowest score was the healthcare organizations not applying the medications safety program policy and procedures that measured most healthcare government or private not fully realized the dental medications safety program. The dentist agreed on the significant barriers to medication safety during dental practice, containing the low dental knowledge level about medication safety and might not be taken during dental school. The other tremendous fences to preventing medication safety in dental care were the absence of periodic medication safety courses at their working organizations, which reproduce the needed foundations of dental medication safety not happened at their healthcare institutions. Despite that, the dentists willing to implement any medications, comprising any hazardous drugs, and tolerate any additional extra work of dental medication safety practice. The dentists need recurrent

education and training on medication safety in dental practice during the college of dentistry and postgraduate education. Also, regular training in basic medication safety in dental care is required at their healthcare institutions in Saudi Arabia.

There is no statistically significant difference between gender and all medication safety element insights. Except for males, more understanding than females in leadership positions or related activities. For example, they endorse medication errors documentation, education, and training courses about medication safety and dental medication wastage procedures. There is no statistically significant difference among all ages level and insight of all facets of medications safety in a dental practice that's imitated the medications safety guidelines are highly challenging for all dental care regardless of their dentist's age. There is no statistically significant

difference among all levels of the number of years experiences and insight of all aspects of medications safety during dental care. Except the less than one year experiences more agreement and importance of healthcare insurance coverage of drugs safely because the new practitioner wants something to defend him if any medication errors happened. There is no statistically significant difference between all academic qualifications levels. Except, the general practitioner settled because dental therapeutic guidelines are not extensively executed. Absent of a training course in medication safety and health insurance of medications safety. Besides, high claims of altering drug interactions and pregnancy and lactation during practice to avoid medication errors have reproduced the dental practitioner, which has more requirements to recover medication safety in dental care. There is no statistically significant difference among all dental positions and all insights of drug safety elements that replicate all dentists' positive perceptions.

There is no statistically significant difference between the discernment of barriers of avoiding implementation of medications safety and both types of sex and all ages levels, which reproduced a positive insolvency to remove all problems and implement dental medications safety services. There is no statistically significant difference among all groups of several years experiences and insight of all tasks of implementation medications safety during dental care except the less than one-year experiences more agreement, the stress of the absence of education and training programs of medications safety. In contrast, higher experiences emphasize the extra work, lack of time and obligation excepted because the new practitioner wants education and training. In contrast, old experiences face more assignments in dental care. There is no statistically significant difference among all dental qualifications except the residents not approving medication error documentation related to residents' high workload than the general dental practitioner. There is no statistically significant difference between all dental positions employees, and all barriers to avoiding medications' safety facets in dental practice, accentuating all obstacles, should be detached and employed in the dental medications safety program.

Limitations

The current study had an authenticated self-assessment survey with planned sample size and followed STROBE guidelines of writing observational studies. However, the study did not grasp the optimal sample number;

most responders were young with low years of experience. Additional studies are highly suggested with such detail in each medication's safety facets in the future.

CONCLUSION

The dentists had an optimistic insight into medication safety in dental practice. Lack of clinical knowledge and periodic training of medication safety were noteworthy contests in dental care. Targeting education and training during undergraduate and postgraduate dental schools is highly suggested to be applied in Saudi Arabia.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Consent for Publications

Informed consent was obtained from all the participants

Ethical Approval


This research is exempted from research and ethical committee or an institutional review board (IRB) approval.

<https://www.hhs.gov/ohrp/regulations-and-policy/decision-charts-2018/index.html>

ABBREVIATIONS

MOH: Ministry of Health; **KSA:** Kingdom of Saudi Arabia; **SPSS:** Statistical package of social sciences; **JASP:** Jeffery's Amazing Statistics Program; **STROBE:** Strengthening the reporting of observational studies in epidemiology.

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